The African Organisation for Standardisation

EDICT OF GOVERNMENT

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`ARS 862 (2012) (English): Fortified cooking oils -- Specification`

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Fortified cooking oils and fats — Specification

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Foreword

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This African Standard was prepared by the ARSO Technical Harmonization Committee on Agriculture and Food Products (ARSO/THC 1).

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Introduction

Vitamin A deficiency is the single most important cause of childhood blindness in developing countries and contributes significantly to morbidity and mortality from common childhood infections. Where the deficiency is widespread, the risk of childhood mortality can be reduced on average by 23% through provision of sufficient vitamin A.

Vitamin A is a yellow, oil soluble crystal, which can be uniformly distributed in oil. The body easily absorbs added vitamin A in the presence of oil. Vitamin A is unstable when exposed to light (particularly UV light), air, oxidizing agents and heat. Heavy metals and acids, even in trace quantities, can accelerate decomposition. Vitamin D exhibits similar stability in fats and oils. It can be assumed that there is a direct relationship between the stability of the vitamin and the oxidation status or peroxide value of the oil. The higher the peroxide values the greater the loss. Using high quality oil and protecting the oil from oxidization and rancidity is therefore basic to preserving the vitamin A. Moreover, on a percentage basis stability of vitamin A depends on the level of fortification. Since there are a given amount of oxidative components in the oil with which the vitamin A can react, the percentage of retention will be greater when higher levels of vitamin A are added.

The technology of vegetable oil fortification with vitamin A is well established, fairly simple and easily achievable by producers. No change in current oil packaging is required except for labeling. Analysis shows no potential problems with safety or excessive vitamin A intakes at the suggested level of fortification.

The stability of vitamin A in oil is greater than other currently used food vehicles such as flour, sugar or corn soy blends. Losses are estimated at 5% during shipping and 10% during open storage in the field. Cooking losses will range from 5% for boiling or simmering to 20% when the food is fried. Higher losses, over 50%, would occur with very high temperature and/or repeated frying, but this type of application is not believed to be common with vegetable oil.

This African Standard seeks to establish a uniform regime for fortification which, if adopted, would make it possible to trade in cooking oils and fats across the borders of the countries in the continent.

Fortified cooking oils and fats — Specification

1 Scope

This African Standard specifies the requirements and methods of sampling and testing for fortified edible oils and fats intended for human consumption.

This standard is not applicable to margarine and like products where other specific standards exist.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ARS 53, *General principles of food hygiene — Code of practice*

ARS 56, *Prepackaged foods — Labelling*

CAC/GL 1, *Codex Alimentarius guidelines for claims*

CAC/GL 2, *Codex Alimentarius nutrition labelling for claims*

CAC/GL 21, *Principles for the establishment and application of microbiological criteria for foods*

CAC/GL 23, *Guidelines for use of nutrition and health claims*

CODEX Stan 192, *General standard for food additives*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

ISO 5555, *Animal and vegetable fats and oils — Sampling*

ISO 660, *Animal and vegetable fats and oils — Determination of acid value and acidity*

ISO 661, *Animal and vegetable fats and oils — Preparation of test sample*

ISO 662, *Animal and vegetable fats and oils — Determination of moisture and volatile matter content*

ISO 663, *Animal and vegetable fats and oils — Determination of insoluble impurities content*

ISO 3960, *Animal and vegetable fats and oils — Determination of peroxide value-iodometric (visual) endpoint determination*

ISO 8294, *Animal and vegetable fats and oils — Determination of copper, iron and nickel contents – Graphite furnace atomic absorption method*

ISO 10539, *Animal and vegetable fats and oils — Determination of alkalinity*

ISO 15304, *Animal and vegetable fats and oils — Determination of the content of trans fatty acid isomers of vegetable fats and oils-Gas chromatographic method*

ISO 27107, *Animal and vegetable fats and oils — Determination of peroxide value-Potentiometric end-point determination*

3 Definitions

For the purpose of this standard the following definitions apply.

3.1
fats and oils
food stuffs which are composed of glycerides of fatty acids of vegetable, animal or marine origin. They may contain small amounts of other lipids such as phosphatides, unsaponifiable constituents and free fatty acids naturally present in the fat or oil.

3.2
blended fats and oils
a mixture of two or more fats and/or oils of plant and/or animal origin

3.3
virgin fats and oils
vegetable fats and oils obtained, by mechanical procedures, e.g. expelling or pressing, and the application of heat only, without altering the nature of the oil. They may be purified by washing with water, settling, filtering and centrifuging only.

3.4
cold pressed fats and oils
are edible vegetable fats and oils obtained, without altering the oil, by mechanical procedures, e.g. expelling or pressing, without the application of heat. They may have been purified by washing with water, settling, filtering and centrifuging only

3.5
refined fats and oils
edible fats and oils obtained by mechanical procedures and/or solvent extraction and subjected to refining processes to adopt it specially for use in food products.

3.6
edible fats and oils
food stuffs which are composed of glycerides of fatty acids of vegetable, animal or marine origin complying with the provisions of this standard. They may contain small amounts of other lipids such as phosphatides, unsaponifiable constituents and free fatty acids naturally present in the fat or oil.

3.7
fortified edible fats and oils
edible fats and oils containing added micronutrients in accordance with this standard

3.8
fortificant
a compound which contains the specified micronutrient intended to be added to a food vehicle

3.9
food fortification
practice of deliberately adding essential micronutrients in a food to improve the nutritional quality of the food and to provide a public health benefit with minimal risk to health

4 Quality requirements and essential composition

4.1 Organoleptic characteristics

Fortified edible fats and oils shall be free from foreign and/or rancid odour and/or taste. The colour of the product shall be characteristic of designated product.

4.2 Chemical and physical characteristics

Fortified edible fats and oils shall conform to the maximum levels for physical and chemical characteristics indicated in Table 1.

Table 1 — Maximum limits[1] for physical and chemical characteristics for fortified edible fats and oils

Parameter	**Level**	**Method of test**
Matter volatile at 105 °C, % by mass, max.	0.2	ISO 662
Insoluble impurities, % by mass, max.	0.05	ISO 663
Soap content, % by mass, max.	0.005	ISO 10539
Iron (Fe):		ISO 8294
Refined fats and oils, mg/kg, max	2.5	
Virgin fats and oils, mg/kg, max	5.0	
Cold pressed fats and oils, mg/kg, max	5.0	
Copper (Cu):		ISO 8294
Refined fats and oils, mg/kg, max	0.1	
Virgin fats and oils, mg/kg, max	0.4	
Cold pressed fats and oils, mg/kg, max	0.4	
Acid value:		ISO 660
Refined fats and oils, mg KOH/g fat or oil, max	0.6	
Virgin fats and oils, mg KOH/g fat or oil, max	4.0	
Cold pressed fats and oils, mg KOH/g fat or oil, max	4.0	
Peroxide value[2]:		ISO 3960 or ISO 27107
Virgin oils and cold pressed fats and oils, milliequivalents of active oxygen/kg oil, max	15	
Other fats and oils, milliequivalents of active oxygen/kg oil, max	10	

[1] The impact of these parameters on the stability of vitamin A in fortified edible fats and oils is not conclusively known. Users of the standards should evaluate such impacts.

[2] In order to ensure the stability of vitamin A in fortified oil, edible fats and oils should be fortified only at peroxide values below 2 milliequivalents of active oxygen/kg oil

5 Fortification requirements

5.1 Levels of vitamin A[1]

The fortified edible oil or fat shall conform to the requirements and the levels of vitamin A provided in Table 2.

Table 2 — Requirements for Vitamin A in fortified edible oil or fat

Nutrient	**Fortificant compound**	**Recommended factory level**	**Regulatory levels, mg/100g**	
			Minimum	**Maximum**
Vitamin A	Vitamin A (Retinol) palmitate	3.5±0.5	2.0	4.0

5.2 Fortificants

Vitamin A shall be added in the form of stabilized vitamin A compound such as vitamin A palmitate 1.7 m IU[2]/g or 1.0 m IU/g.

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[1] Countries may add other micronutrients such as vitamin D if available country data indicate deficiency in such nutrients.

[2] One International Units (IU) of Vitamin A = 0.33 micrograms Retinol equivalent

Fortificant for use shall be stable compounds conforming to specifications in any of the following documents:

a) British Pharmacopoeia (BP),

b) Food Chemical Codex (FCC),

c) Merck Index (MI),

d) United States National Formulary (NF),

e) European Pharmacopoeia (Ph Eur),

f) United States Pharmacopoeia (USP);

g) CAC Codex Alimentarius Commission

6 Food additives

Fortified edible fats and oils may contain only those food additives and in amounts as indicated in CODEX STAN 192.

7 Contaminants

7.1 Heavy metals

Fortified edible fats and oils shall conform to the maximum limits for heavy metals established in CODEX STAN 193.

7.2 Pesticide residues

Fortified edible fats and oils shall conform to the maximum residue limits for pesticide residues established by the Codex Alimentarius Commission for this commodity.

8 Hygiene

Fortified edible fats and oils shall be produced, prepared and handled in accordance with the provisions of appropriate sections of ARS 53.

9 Packaging

9.1 Fortified edible fats and oils shall be packaged in food grade, non-absorbent materials which do not have adverse influence upon effects on the composition of the product, its properties and appearance.

NOTE 1 Packaging materials may be required to meet different regulations in the different destination countries.

NOTE 2 The package fill should conform to the requirements of the legal metrology of the destination country.

10 Labelling

10.1 General labelling

In addition to the mandatory labelling provisions found in ARS 56, the following specific provisions apply:

a) The name of the product shall be edible “X” fat or oil or blended “X” fat or oil where X is the word vegetable or animal or name of such vegetable or animal.

b) The words “fortified with Vitamin A” shall be declared in close proximity to the name of the oil or fat.

c) The words cold pressed, virgin, non-virgin or refined shall be declared on the label to indicate the type of oil or fat.

d) Where vegetable fat has been subject to any process of esterification or to processing which alters its fatty acid composition or its consistency, the name of the product or any synonym shall not be used unless qualified to indicate the nature of the product.

e) Date marking shall be declared in the following manner: The "date of minimum durability" (preceded by the words "best before") shall be declared by the day, month and year in uncoded numerical sequence except that for products with a shelf life of more than three months, the month and year will suffice.

f) Instructions on disposal of used package;

g) Each product unit may also be marked with the national food fortification Logo, where the industry qualifies to use the mark.

10.2 Labelling exemptions

The following exceptions shall apply:

a) The product shall be designated in accordance with the laws of the community and in manner so as to not mislead the consumer about the nature of the product.

b) The labelling of non-retail containers is restricted to outer containers for a number of prepackaged foods only and shall appear in the following manner:

   i) The name of the product,

   ii) Lot identification; and

   iii) The name and address of the manufacturer or packer shall appear on the container.

10.3 Labelling prohibition

Edible fats and oils consisting of fats and/or oils of animal origin or marine origin shall not be labelled vegetable fats or oils.

10.4 Nutrition labelling

The amount of vitamin A in the fortified fat or oil shall be declared on the label in accordance with CAC/GL 2.

10.5 Nutrition and health claims

Fortified fats and oils may have claims on the importance of the vitamin A in nutrition and health. Such claims when declared shall be consistent with CAC/GL 1 and CAC/GL 23.

11 Methods of sampling

Sampling shall be done in accordance with the ISO 5555.

12 Methods of testing

Testing for micronutrients may be conducted using any internationally recognized methods of test.

Bibliography

EAS 769:2012, *Fortified edible oils and fats — Specification*

CODEX STAN 19: 1981 (Rev 1987, 1999. Amend 2009), *Codex Standard For Edible Fats And Oils Not Covered By Individual Standards*